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Environmental Services ∘ Asbestos Collection & Testing ∘ Consultation

ASBESTOS MANAGEMENT PLAN

PREPARED FOR

OTIS MEMORIAL ELEMENTARY SCHOOL
5800 CURTIS BOULEVARD
OTIS ANGB
BOURNE, MA 02542

BOURNE PUBLIC SCHOOL SYSTEM

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Date: October 11, 1988

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Certification: Commonwealth of Massachusettes Certification as Inspector (I-00055) and Management Planner (MP-00098).

This management plan meets the requirements of the EPA "Asbestos Containing Materials in Schools" Rule, 40 CFR 763, as specified in the Asbestos Hazard Emergency Response Act (AHERA).

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OTIS MEMORIAL ELEMENTARY SCHOOL
Otis ANGB, MA 02542

SECTION 1 INSPECTION REPORT

This section provides a general description and overview of the school, its size, date of construction and/or modification, location, and student inspection/management plan detailing those locations where asbestos-containing building materials (ACBM) or suspect ACBM were identified by the inspector, as well as the friability, physical condition, potential for damage or disturbance of the ACBM.

1(A) GENERAL BUILDING DESCRIPTION

Otis Memorial Elementary School is a one story structure, with a two story combined cafeteria/gymnasium/auditorium in the center. The school is built on a concrete slab with conventional foundation. The building has external brickface, over an air space and eight inch concrete blocks. The roof is corrugated steel sheet under steel beam and frame. The interior classroom walls are plaster topcoat and cementitious material on a metal lath grid. Hallways and common areas are concrete block.

The exact date of construction is not known, but is believed to be around 1960 to 1962. Since the three schools on Otis ANGB were built at the same time, this date is likely to be accurate. There have been no additions to the original school building since that time. The structure of the school is two classroom wings at a 90 degree angle, with the gymnasium/auditorium and cafeteria in the center by the main entrance to the building. Otis has 19 classrooms or instructional areas, the all-purpose room and offices. The school supports a total of 412 students, including 14 special needs students in grades K through 3, with a full-time faculty of 22.

Heat in the school is provided by two H.B. Smith # 60 low-pressure steam watertube boilers, and is a combination of forced steam and closed loop continuous hot water to individual radiators in the classrooms. The heating system also provides hot water for domestic consumption. Supply and return lines for the heating system are located in an underground pipe tunnel which loops around both wings of the school from the boiler room, with accessways in several of the classroom areas.

There is approximately 35,165 square feet of usable floor space in Otis, with 4,800 square feet in the pipe tunnel. The approximate dimensions of the building are approximately 65 by 180 feet along the two wings with a cafeteria/kitchen area approximately 50 by 100 feet. A layout of the school building is shown as Figure D-1. The principal locations of ACBM and the locations of samples collected during this survey are shown on Figure D-2.

Following the formal start of the inspection program for the Bourne Public Schools, an opening meeting was held with Mr. Robert Watmouth, Business Administrator for the Bourne Public Schools. Before the inspection at Otis Elementary, a conference was held with the principal, Mr. Frederick Dunberry. A tour of the building was conducted with Mr. Ben Tobey, Head Custodian. During the course of the inspection, interviews were held with mr. Tobey, and Mr. Don Cramer, the second shift custodian. Mr. Tobey has been with the Bourne Public Schools for 28 years, and was most knowledgeable about the history of the school, and the locations of asbestos in the building. The remaining school personnel interviewed were relatively new at this school, and were not knowledgeable about the ACBM.

1(B) SUMMARY OF INSPECTION REPORT

A comprehensive inspection of Otis Memorial Elementary was performed on September 22, 1988 by Scott D. Herzog, CIH. Mr. Herzog is certified as an Asbestos Inspector by the Commonwealth of Massachusetts Department of Labor and Industries, and has met all the requirements for Inspector under the Asbestos-Containing Materials in Schools Rule (40 CFR 763), promulgated by the Environmental Protection Agency to comply with the requirements of The Asbestos Hazard Emergency Response Act (AHERA). Mr. Herzog attended and successfully completed a course for Inspector and Management Planner at Tufts University in January, 1988. Tufts University is recognized as one of five regional facilities which are included in the Asbestos Information Center. Mr. Herzog's Massachusettes Inspector certification is I-00055, and his Management Planner certification is MP-00098. A copy of the license and certificate from Tufts University, as well as a statement of qualifications is appended to this inspection/management plan.

The inspection report was reviewed, with special attention to physical damage, friability, potential for disturbance, and location of asbestos-containing building materials. The findings of the inspection are detailed by homogeneous area and functional space (room, hallway, etc.) in Section 5. Section 1 summarizes the principal findings of the inspection, for purposes of the management plan. ACBM or suspect ACBM was present in this school as thermal system ACBM on boiler surfacing and pipe lagging, and in miscellaneous materials ACBM as vinyl asbestos floor tile. No surfacing material ACBM was observed in Otis Elementary.

A. Thermal System Insulation

A(1) Boiler Room- Surfacing Materials- Heat is provided to the school by two H.B. Smith # 60 low-pressure steam (2-3 psi) watertube boilers. The boilers are equipped with Ray rotary combination gas/oil burners, and operate on # 4 heating fuel oil. The boilers currently operate exclusively on oil from an underground storage tank. Boiler # 1 is the primary heating plant for the school, while boiler # 2 serves as a supplement for peak loads and auxiliary use. The boilers are original equipment from

school construction. Heat is provided by a combination of forced steam and continuous closed-loop hot water to individual Herman Nelson radiator units in the classroom and all-purpose room. The insulated fireboxes of the boilers are approximately 8.7 feet in length by 4.5 feet in height and 8.3 feet in width. They have a two-inch board type insulation on a wire mesh grid on the two sides, top, and rear.

Boiler # 1 is significantly damaged on both sides along the recirculation line on top of the boiler. The surface is split along the length (10% of total area). The board is delaminating on the left rear side (20 square feet), and the right front corner. Samples of the boiler covering were 20 to 40% amosite asbestos.

Boiler #2 was also significantly damaged on both sides along the recirculation line on top of the boiler. The board surface was also delaminating on the right side rear (20 square feet) and along the right front side of the board, near the bottom. A sample from the latter was 80% chrysotile asbestos.

A total of 372 square feet of ACBM was measured on the two boilers.

Each boiler had a transition at the rear to the induced draft fans and breeching. The transitions were insulated with ACBM and were 1.3 feet depth by 7 feet width by 3 feet height. The transitions were generally in good condition with minor damage to the undersides of both surfaces. There is a total of 94 square feet ACBM. Boilers were equipped with Electricarm upward centrifugal induced draft blowers which were not insulated.

The breeching for boilers # 1 and 2 were each 20 by 24 inches and 6 feet in length. The surface covering was intact, but was not encapsulated. It was slightly "soft" to the touch, but not damaged. The main breeching was 24 by 32 inches and 6 feet in length, expanding to 42 inches square and 9 feet in length. The surface was painted but not encapsulated, and was generally in good condition with no damage <u>except</u> where breeching for the boiler # 2 enters the main breeching. There is a total of 269 square feet of ACBM on the breeching.

A hot water storage tank is located behind boiler # 1. The tank is 48 inches diameter by 8 feet length. The surface is cloth-covered and painted, and generally in very good condition, with slight damage at the V-brace at the bottom of the tank. A sample of the insulation was 80% chrysotile asbestos. There is a total of 100 square feet of ACBM on the tank.

A(2)- Boiler Room- Piping- The two boilers feed to a main header. Each boiler feed is equipped with a manual shutoff. The main header has three zone headers which go to the hot water tank, and to the tunnel to provide heat to the classrooms. The main header and zone headers, as well as the small diameter piping in the boiler room is fiberglass insulated with mud cementitious suspect ACBM fittings. The fittings are cloth covered and generally in excellent condition, with no evidence of damage. There are 40 fittings in the boiler room.

A(3) Pipe Tunnel- The pipe tunnel entrance is at the boiler room. There are access panels at alternate classrooms on the outside wall of the building. The tunnel has 4-5 lines through the 900 foot length. Two of the headers are for supply and return, and the balance are for domestic water supply. All lines in the tunnel are insulated with fiberglass. Fittings are all mud cementitious- and are all suspect ACBM. There are approximately 200-300 fittings in the tunnel. All are cloth-covered and in excellent condition. There was no observed damage, or debris on the floor of the tunnel.

A(4) Classrooms- Each classroom had individual radiators, with supply lines from the pipe tunnel. None of the lines were insulated above floor level. Classrooms with water lines were not insulated. Entryways between classrooms also had one radiator with no insulated piping.

A(5) Custodian- All plumbing for the student bathrooms was behind tiled wall surfaces and not accessible. A panel in the custodians room served as the access to plumbing shutoffs for both bathrooms. All pipe insulation is fiberglass. There are 7 of 40 significantly damaged mud cementitious ACBM fittings at the rear of the access.

A(6) Women's Room- All plumbing for teacher bathrooms was behind tiled wall surfaces and not accessible. A panel in the women's room served as access to plumbing shutoffs for both bathrooms. All pipe insulation is fiberglass. There are 3 of 40 significantly damaged mud cementitious ACBM fittings in the access.

A(7) Nurse Room- There is one sink with a fiberglass insulated line. There are 5 mud cementitious ACBM fittings which are cloth covered and in excellent condition.

A(8) Kitchen/Food Storage- This area has two Nelson ceiling mounted radiators. Piping is insulated with fiberglass. There are six mud cementitious ACBM fittings, which are cloth covered and in very good condition with no damage.

A(9) Supply Room- Two lateral headers pass through supply room. The lines are insulated with fiberglass and have six mud

cementitious ACBM fittings, all cloth covered and in excellent condition.

B. Miscellaneous Materials ACBM-

B(1) Vinyl asbestos floor tile (VAT)- All of the classrooms and the all-purpose room were covered with either nine-inch striated or speckled floor tile. This tile is the original tile installed in the school. All of the tile is considered to be homogeneous (uniform) by appearance. Condition of the tile varied from undamaged to significantly damaged with severe wear and/or broken or damaged tile surfaces. The condition of the tile in each damaged area is shown below. Samples of floor tile were collected in six areas which were representative of all the types of tile present in the building. All but one contained from 1 to 5% chrysotile asbestos. (Note: Polarized light microscopy has inherent error when analyzing bulk samples containing less than 5 % asbestos. Results should be confirmed by electron microscopy before undertaking major abatement projects.) It may be assumed that all floor tile in the Otis Elementary is ACBM. Typical classrooms contain an average of 800-1000 square feet of floor space. Based on this figure, there is approximately 32,000 square feet of VAT.

Room	Condition
Cafeteria	Older tan tile- High wear, moderate damage. Tan/Gray Tile- Moderate wear, no damage
C/R 1&2 Hallway	Moderate wear, one broken tile
C/R 17	Moderate wear, five broken tiles by front of room
C/R 15	Moderate wear, damaged areas in aisle near sink. Some damage (water?) by door.
C/R 14	Two large damaged areas, 10 broken tiles, 30 lifting ones.
C/R 13	High wear, several damaged areas by front of room with 15 broken tiles, 30 lifting ones.
C/R 12	Severe wear center of room, no broken tiles
C/R 12&13 Hallway	6 broken/damaged tiles
Side Entry	20 lifting tiles by radiator.
Main Entry	Tiles lifting by front door and along right wall by radiator.
C/R 6	Moderate to severe wear by sink, no damage.
C/R 7	16 broken tiles
C/R 6&7	Moderate wear, 7 broken tiles by door and bathroom

Except as noted above, there was no other ACBM or suspect ACBM in Otis Elementary.

A summary of damaged or significantly damaged ACBM or suspect ACBM using the categories defined by the EPA is as follows:

Location	----Significantly Damaged or Damaged---- Thermal System ACBM	Surfacing Material Friable ACBM	Miscellaneous Materials Friable ACBM
A(1)	372 SQ. FT.	----	----
A(2)	------	----	----
A(3)	------	----	----
A(4)	------	----	----
A(5)	7 FTNGS.	----	----
A(6)	3 FTNGS.	----	----
A(7)	------	----	----
A(8)	------	----	----
A(9)	------	----	----
B(1)	------	----	1500 SQ.FT.
Total	372 SQ. FT. 10 FTNGS.	NONE	1500 SQ.FT.

A summary of all ACBM or suspect ACBM in the Otis Elementary School is as follows:

Location	Thermal System ACBM	Surfacing Material ACBM	Miscellaneous Materials ACBM
A(1)	835 SQ. FT.	----	----
A(2)	48 FTNGS.	----	----
A(3)	300 FTNGS.	----	----
A(4)	------	----	----
A(5)	40 FTNGS.	----	----
A(6)	40 FTNGS.	----	----
A(7)	5 FTNGS.	----	----
A(8)	6 FTNGS.	----	----
A(9)	6 FTNGS.	----	----
B(1)	------	----	32,000 SQ.FT.
Total	835 SQ. FT. 445 FTNGS.	NONE	32,000 SQ.FT.

1(C) SUMMARY OF PREVIOUS INSPECTIONS AND RESPONSE ACTIONS

1. An inspection of Otis Elementary School by Massachusettes Department of Labor and Industries was performed on June 18, 1985 by Mitchell Campbell, Industrial Hygiene Engineer. His findings included: (1) the right boiler casing displayed minor cracks and the left boiler casing displayed a few cracks with slight bulging damage; (2) all observed piping insulation was in good to excellent

condition; (3) no pipe or spray-on insulation was noted in any of the classroom areas. No bulk samples were collected during this inspection. (Note: Interviews with the custodial staff indicate no major corrective action had been undertaken since 1985.)

2. An inspection of all Bourne schools was performed by Dr. Charles Spooner in late 1982, by Bolt-Beranek & Newman (Dr. Spooner formed Hygeia, Inc. during the inspection process. Reports are filed under Hygeia name.) The report for Otis Elementary was not available or reviewed during this inspection process.

3. No records of asbestos inspections or asbestos abatement projects were available in the school. No planned or scheduled asbestos abatement projects have been conducted at Otis, as noted in the inspection phase, and confirmed with the custodial staff. Approximately eight years ago, exposed joints were taped and encapsulated. The boilers have not been resurfaced or encapsulated. Most repairs were made by members of the Bourne Maintenance Department. (This was later confirmed in interviews with members of the Maintenance Department.)

SECTION 2 HAZARD ASSESSMENT

The objective of this section is to identify the potential for fiber release and prioritization of corrective measures, based on actual and potential damage, location, friability, and potential for disturbance. Hazard assessment involves an analysis of factors which might contribute to actual or potential exposure of building occupants. The management planner reviews the findings of the facility inspection including but not limited to friability, deterioration, and physical or water damage to the ACBM. The potential for disturbance (accessibility which might lead to exposure), such as poking holes or scratching initials in surfacing ACBM, vibration, and the presence of air flow are considered.

There are several recognized rating or ranking schema used to make an assessment of the overall condition, in order to make "an informed, responsible recommendation to the LEA consistent with response action requirements". These rating systems include matrix stratification, algorithms which rank each factor numerically, tables and logic trees. All these systems are both objective and subjective to some degree, and depend upon the individual planner.

The method used in this management plan is a straightforward one. It is a "decision tree" or "logic tree", developed by the EPA, and published in "Guidance for Assessing and Managing Exposure to Asbestos in Buildings." It was selected as the most easily interpreted rating schema for the building owner, and one which could easily be reviewed or repeated by a management planner at three-year interval reinspections. The decision trees for surfacing materials

and thermal system materials are found as Figures L-1 and L-2. Each "logic tree" routes the planner through a set of choices, to select one of eight response actions. The actions are numbered one through eight, with one representing the highest priority response. Each of the eight response actions is identified with a descriptive course of action which might include removal, repair, encapsulation, enclosure, or operations and maintenance. The corrective actions are defined in the Asbestos-Containing Materials in Schools Rule (40 CFR 763) as follows:

Removal: Taking out or stripping of substantially all ACBM from a damaged area, functional space, or homogeneous area in a school building.

Repair: Returning damaged ACBM to an undamaged condition or intact state. This action is normally limited to localized damage.

Encapsulation: The treatment of ACBM with a material that surrounds or embeds the fibers in a matrix to prevent release. There are two types of encapsulants- penetrating, and bridging. Penetrating encapsulants bind the fibers together to form a hard mass less susceptible to damage or friability. Bridging encapsulants are applied to the outer surface, forming a hard shell on the surface, which reduces the potential for further damage. Both types may be applied by brush or through the use of an airless sprayer.

Enclosure: Construction of an essentially airtight, impermeable, permanent barrier around ACBM to control the release of fibers to the air. For example, a solid metal or plywood wall would classify as an enclosure, however carpeting over vinyl-asbestos floor tile, or lay-in acoustical tile over spray-on insulation would not classify as enclosures.

Operations & Maintenance: A program of training, work practices, and periodic surveillance designed to maintain the condition of friable ACBM and to prevent further release by minimizing and controlling friable ACBM disturbance or damage. The O & M program is described in detail in Section 6.

2(A) PROPOSED RESPONSE PLANS

A. Thermal System Insulation

A(1) Boiler Room-Surfacing- Significantly Damaged, Moderate Disturbance. The surfacing on both boilers is significantly damaged and delaminating on the side walls. Response Action 1. Restrict area. Repair the damaged areas as soon as possible to prevent release of friable ACBM. Schedule encapsulation of the boilers at the conclusion of the heating season. In the interim, maintain under O&M and take preventative measures to minimize disturbance. Repair damaged areas on the boiler transition and breeching at the same time.

A(2) Boiler Room- Piping- No Damage, Moderate Disturbance. The fittings are currently undamaged, but maintenance activities in the area may cause future disturbance. Response Action 8. Maintain under O&M until renovation or demolition requires

removal under NESHAPS. In interim, take preventative measures to reduce disturbance.

A(3)- Pipe Tunnel- No Damage, Low Disturbance. The pipe tunnel is used only for servicing on pipes, and not for storage. The area is not accessible to students. All fittings are presently undamaged and in good condition, with no visible debris. Response Action 8. Maintain under O&M, and continue to monitor condition of fittings. Repair friable fittings as they are noted.

A(5)- Custodians Room- Significantly Damaged, Low Disturbance. There are 7 significantly damaged fittings at the rear of the access, with open friable surfaces. Response Action 2. Remove and replace these fittings. Maintain under O&M, and encapsulate the remainder of the fittings to prevent future disturbance.

A(6)- Women's Room- Significantly Damaged, Low Disturbance. There are 3 significantly damaged fittings in the access area, with open friable surfaces. Response Action 2. Remove and replace these fittings. Maintain under O&M, and encapsulate the remainder of the fittings to prevent future disturbance.

A(7)- Nurse- No Damage, Moderate Disturbance. The fittings are in excellent condition with no evidence of damage. Response Action 7. Maintain under O&M program. Encapsulate fittings or remove insulation on a lower priority as funding permits.

A(8)- Kitchen- No Damage, Moderate Disturbance- The fittings are on ceiling mounted radiators. They are in excellent condition with no evidence of damage. Response Action 8. Maintain under O&M program, until renovation or demolition requires their removal under NESHAPS.

A(9)- Supply Room- No Damage, Low Disturbance- The fittings are in excellent condition with no evidence of damage. Response Action 8. Maintain under O&M program, until renovation or demolition requires removal under NESHAPS.

B. Miscellaneous Material ACBM

B(1) Vinyl asbestos floor tile- Damaged, High Disturbance. Floor tile in several classroom areas showed evidence of water damage with broken tiles. In addition, many showed evidence of moderate to severe wear. Response Action 3. Remove damaged and broken tiles, and those areas with severe wear. Implement O&M program to reduce further damage to the tiles. Do not use abrasive pads or cleaners on floor surfaces prior to waxing. Do not cut or drill through the tile. Place rubber feet or gliders on desks and chairs to reduce holes and pock marks. Evidence of a dull white appearance through the tile indicates a breakdown of the top matrix layer.

SECTION 3 HAZARD PRIORITY RANKING AND RESPONSE ACTIONS

The ranking utilizes the response actions developed by the management planner, and assigned to the ACBM described above, and prioritizes the order of corrective measures to be undertaken by the LEA. Where funding is not available to implement the entire program of recommended measures at one time, a prioritization of those actions is required. This ranking is a forced ordering, and should only be used as a guideline, not as an absolute ranking. Where response actions are the same for two or more items, they are ranked in relative importance, based on the potential for exposure, and the effort needed to implement controls.

Recommended response actions are developed by the management planner based on the assessment described above. The LEA has the final decision on the response actions and priorities to be undertaken. Table T-1 describes the relative advantages and disadvantages of each response action. Consideration should be given to the applicability of a particular response action for a particular building. In other words, no one response is correct for all buildings. Factors to be included in the decision are the current and future use of the affected school area, whether further damage could occur, and the availability of funding to implement one of the corrective actions.

3(A) PROPOSED RESPONSE ACTIONS

Ranking	Response	Location/Description of Action
1	1	Boiler Room- Surfacing- Restrict access. Repair damaged areas as soon as possible to prevent release of friable ACBM. Post signs on doorway. Schedule encapsulation of boiler surfacing at the end of the heating season.
2	2	Custodians Room- Remove the 7 fittings on a priority basis. Encapsulate the balance with rewettable fiberglass cloth.
3	2	Womens Room- Remove 3 fittings in the access on a priority basis. Encapsulate the balance with rewettable fiberglass cloth.
4	4	Vinyl tile- Remove the damaged portions of floor tile and replace. Implement O&M program to reduce disturbance.
5	5	Nurse- No corrective action required. Monitor condition, and maintain under O&M.

No immediate corrective actions are required for the other areas or materials, indentified in the body of report.

3(B) STAGING OF ABATEMENT ACTIONS

Several considerations must be evaluated when scheduling abatement activities. These factors include:

(1) The potential for exposure to occupants of the building.
(2) The desirability of completing the work during the summer months when the school in not in session.
(3) The desirability of completing the project prior to the start of the heating season, even if school is in use at the time.
(4) The availability of funding to perform the work.
(5) The availability of contractors to perform the work.

Removal of damaged fittings in two access areas could be performed during the school year. Similarly small repairs to surfacing on the boiler surfacing, transitions, breeching, hot water tank and boiler room piping could be performed during short recess periods in the winter or spring. Encapsulation of the boiler surfaces would have to be performed during the summer, after the end of the heating season. The O&M program should be developed and implemented as soon as possible. Based on these factors, the following schedule is proposed:

1. Repair friable surfaces on boiler covering ..... 1Q, 1989.
2. Repair damaged areas on transition, breeching, ... 2Q, 1989 hot water tank, and piping in boiler room.
3. Encapsulate boiler surfacing 3Q, 1989
4. Remove damaged fittings in two access areas..... 1Q, 1989
5. Implement O&M program for periodic ..... 2Q, 1989 reinspections and maintenance.

SECTION 4 COST ESTIMATION AND CONTRACTOR SELECTION

This section describes the estimated costs of implementing the response action plans described above. These estimates are developed for budgeting purposes only, to evaluate the costs of different response actions. It may be considered on the order of an engineering estimate- that is +/- 25 percent. They do not constitute a firm bid for the abatement work, or a proposal to perform the work for the estimated amount. Two estimates are presented- the first based on implementation of the recommended corrective measures, and the second based on complete removal of ACBM from accessible areas of the building. The latter may be a desired approach in some circumstances, and will offer the LEA a range of costs associated with the two approaches, for planning and budgeting purposes.

One of the most important decisions to be made by the LEA is the choice of an asbestos abatement contractor. An experienced, knowledgeable contractor can make an abatement action proceed smoothly. Conversely, a poor contractor could potentially cause greater release of asbestos fibers in the schoòl through improper work practices. This section reviews some of the considerations which

should be included in the selection of an abatement contractor.

The use of an engineering firm to serve as "project monitor" during the abatement is highly recommended. The monitor serves as the "eyes and ears" of the building owner before, during, and after the completion of an abatement response. The monitor provides quality assurance services including the collection of air samples and visual inspections. Ais sampling might include the collection of pre-abatement samples to establish a background concentration, sampling during the abatement to assure that no asbestos is leaving the work area, and clearance samples to assure the project has been completed. The monitor also oversees the contractor to assure that all work is performed in accordance with the schedule and other contract documents, as well as in accordance with local, state and federal regulations pertaining to asbestos abatement projects. This section also describes some of the considerations which should be evaluated in the selection of an engineering firm.

4(A) PROJECT COST

Location/Action	Estimated Cost (Current $) Recommendation	Total Removal
1. Repair damaged areas on boiler surface, then encapsulate.	$ 2,700.00	$ 8,400.00
2. Repair damaged areas on transition,breeching,hot water tank.	$ 500.00	$ 9,300.00
3. Mud fittings in boiler room	------	$ 2,400.00
4. Mud fittings in pipe tunnel Inspect and repair if needed	$ 1,000.00	$ 15,000.00
5. Remove damaged fittings in two access areas for pipes.	$ 500.00	$ 2,500.00
6. Fittings in nurse, kitchen supply areas.	------	$ 850.00
7. Remove and replace damaged vinyl asbestos floor tiles.	$ 3,000.00	$ 180,000.00
Total	$ 7,700.00 to	$ 218,450.00

Note: The estimated cost for removal of all ACBM, except for floor tile is $ 38,450.00.

These prices are based upon current abatement costs quoted by contractors in New England. As an approximate guide, the cost of removing pipe lagging is $ 18.00 per linear foot, of removing boiler surfacing material is $ 20.00 per square foot, of removing vinyl asbestos floor tile is $ 6.00per square foot, and of encapsulating boiler surfacing is $ 6.00-8.00 per square foot.

4(B) CONTRACTOR SELECTION SPECIFICATIONS

While bid cost is certainly an important consideration in the selection of an abatement contractor, it must not be the only consideration. Careful planning and preparation are the most important keys to a successful project. Adequate information must be provided to the contractor to permit a bid, and certain information must be obtained from the final bidder or bidders before an award is made.

(1) Previous experience with the contractor on similar projects at the facility which define the contractor's abilities. The contractor should demonstrate reliability through submission of a list of references. Preferably, the contractor should have a minimum of three years of experience, and be able to provide a list of ten references. At least three of these should be on projects of similar scope and size as the one proposed.

(2) The contractor should maintain and provide a copy of the comprehensive general liability and professional liability (errors & omissions) insurance policies, stating the insurewr, policy number, type of coverage, aggregate amount, and expiration date. Policies for worker compensation, and driver/vehicle insurance should be provided as well. Review the policies with your legal counsel.

(3) The contractor should provide a complete list of the training courses attended by the person who will serve as site supervisor for the project. The firm should provide evidence that all workers have completed the requirements for worker training, and that both workers and supervisor are certified/certifiable in the Commonwealth, in compliance with 453 CMR 6.0, as well as local, and federal regulations for asbestos abatement.

(4) The contractor should provide a copy of the written standard operating procedure, and work practices, including specific references to OSHA and EPA standards.

(5) The contractor should comply with all current and proposed asbestos abatement regulations in the Commonwealth of Massachusetts.

(6) The contractor should provide a description of all projects which have been terminated prematurely, and the circumstances surrounding the termination.

(7) The contractor should provide a list of any citations levied against the contractor by local, state, or federal agencies for violations related to asbestos abatement. The contractor should also provide a description of any legal proceedings, lawsuits, or claims in reference to asbestos abatement.

(8) The Bourne Public Schools and the selected contractor should take special care to assure that there is understanding and acceptance of the terms and conditions of the contract by both parties prior to the start of any work.

Most importantly, the Asbestos Program Manager should have effective communication and a sense of confidence in the ability of the contractor, and have a good working relationship with the primary contact at the firm.

4(C) ENGINEERING FIRM SELECTION

As with the contractor, there are several considerations in the selection of the engineering representative.

(1) As stated, the firm is the liason between the building owner and the abatement contractor, and will be in daily communication with the building owner on the status of the project. Effective communication, and a sense of confidence in the ability of the engineering firm should be the most important criterion.

(2) Persons involved with the project on-site should have attended approved training courses as a Project Monitor. Individual(s) must be certified by the Commonwealth of Massachusetts, Department of Labor and Industries as Project Monitor(s).

(3) Previous experience with the engineering firm on similar projects at the facility which define the firm's abilities. Firms should demonstrate reliability through submission of a list of references. Preferably, the engineering firm or principal assigned to the project should have a minimum of two years of experience in monitoring similar projects.

(4) The engineering firm should provide a copy of the comprehensive general liability, and professional liability (errors & omissions) insurance, stating the insurer, policy number, type of coverage, aggregate amount, and expiration date. Policies for worker compensations, and driver/vehicle insurance should be examined as well. Review all policies with your legal counsel.

(5) The laboratory used by the engineering firm should be licensed in the Commonwealth of Massachusetts to perform asbestos fiber counting. The laboratory should participate in the NIOSH Proficiency Analytical Testing program, and be accredited by the American Industrial Hygiene Association, or the individual performing the fiber counting be listed in the AIHA Asbestos Registry.

(6) The individual providing on-site support should be an industrial hygienist by training, or should be under the direction of a full-time industrial hygienist. All training shall comply with 40 CFR 763.

SECTION 5 INSPECTION REPORT

This section details the findings of the inspector during the on-site inspection of the facility, as well as the results of the samples taken during the inspection. The details and general description of the building(s) are presented in Section 1, and so, are not repeated here. As a part of the physical inspection, the following segments were incorporated:

(1) A review of all maps, drawings, and figures which were available at the time of the inspection, and which might identify the presence of asbestos-containing building materials in the school building.

(2) A review of all reports, inspections, studies, and other douments by both private consultants, and representatives of state and federal agencies, which may have identified the location of ACBM.

(3) A review of documents pertaining to any previous abatement activities, available at the time of the inspection.

(4) Discussions with key maintenance and administrative personnel to identify locations of ACBM in the school buildings, or to obtain details on previous abatement activities.

(5) Comprehensive walk-through of the affected school building, including examination of all classrooms, hallways, closets, cabinets, bathrooms, basements, utility areas, mechanical areas, pipe tunnels and chases. The physical condition of all ACBM and suspect ACBM is examined by touching all affected surfaces. Samples are collected for analysis in accordance with the requirements of 40 CFR 763, and analyzed by polarized light microscopy, using the EPA-approved protocol ("Interim Procedure for the Analysis of Bulk Samples").

For purposes of clarity, LF refers to linear feet of insulation, usually as pipe lagging, regardless of the diameter of the pipe or duct. SF refers to square feet, usually as boiler covering, or surfacing insulation. Fittings may include elbows, tees and valves. Fittings are not included or calculated in the measurement of equivalent feet, but are generally expressed as the number of fittings. The term "friable" refers to the ability to crumble ACM using moderate hand pressure, and is used to express the likelihood that ACM can become airborne. Additional terms are described in the glossary to this report.

SECTION 6 OPERATIONS AND MAINTENANCE PROGRAM

The Local Education Agency shall implement an operations, maintenance, and repair (O & M) program whenever any friable ACBM is present or assumed to be present in a building that it leases, owns, or otherwise uses as a school building (Section 763.91(a)). The Operations & Maintenance Program is an integral part of the management plan in any school where asbestos-containing building materials are present. The goal of the O & M program is to establish a set of work practices and housekeeping procedures designed to minimize the potential for workers and occupants of the building to be exposed to asbestos. This program remains in effect as long as ACBM remains in the building, and will be updated to reflect any changes in the location, condition, damage, or potential for exposure to ACBM.

The specific objectives of the O & M program are to develop and provide worker training and work practices which minimize disturbance of asbestos during routine maintenance activities; a plan to perform emergency repair, encapsulation, and enclosure of ACBM, as well as to clean up small amounts of asbestos debris on floors, and other surfaces. The O & M programs generally focus on the maintenance and custodial staffs performing routine activities in the building, rather than large scale abatement projects which will be performed by abatement contractors.

In each school, all custodial employees will be included in the O & M program. One or more maintenance employees for the school system should be designated as emergency responders when asbestos debris is observed, or when emergency repairs are required. O & M work practices are tailored to four types of projects: (1) those which are unlikely to involve any contact with ACBM, (2) those which may cause accidental disturbance of ACBM, (3) those which involve small scale manipulation or removal of ACBM, and (4) those which involve large scale manipulation or removal of ACBM.

The O & M program contains eight major segments as follows:

(1) A written plan defining the objectives and goals of the program.
(2) All occupants of the building are notified of the presence of ACBM, and the results of the survey.
(3) Employee training and education
(4) Scheduling of O & M activities
(5) Establishment of good work practices and procedures for cleaning, maintaining, renovating, remodeling, and repairing buildings where ACBM is present.
(6) Development and implementation of a respiratory protection program
(7) Periodic surveillance of ACBM remaining in the building, noting any changes in conditions.
(8) Maintenance of accurate records of all activities involving ACBM.

6.1 WRITTEN PROGRAM:

Once asbestos is identified in the building, and the decision is made to leave ACBM in the building, the O & M program, under the direction of the Local Educational Agency's Asbestos Program Manager, identifies all asbestos-related activities.

The written program for the Bourne Public Schools are based upon a physical inspection of each school which occurred between July and September, 1988. The inspection report provides a historical documentation for the school, and identifies the location and condition of all ACBM, and records previously documented abatement activities.

Notification: All occupants of the building must be notified of the presence of ACBM. Administrators of primary and secondary schools are required to inform employees and parent-teacher groups about friable ACBM, and to distribute specified instructions on handling ACBM to custodial and maintenance workers. This training will take place through the use of signs, information sessions, and distribution of notices.

Training: All maintenance and custodial workers will be trained in special procedures and work practices designed to minimize disturbance of ACBM, as well as the potential for exposure during routine maintenance activities. Levels of training will depend upon the nature of the task and the potential for disturbing ACBM. Training sessions are identified as a two-hour "general awareness" session, and an additional fourteen hour comprehensive training session.

Reinspection: Periodic surveillance of all remaining ACBM is an important portion of any O & M program. This reinspection is performed semiannually, at a minimum, to assess whether any physical changes have occurred in the condition of ACBM.

6.1.1 IMPLEMENTATION

A successful O & M program requires support from all levels of school management. The Business Manager, Mr. Robert Watmouth, has been identified as the Asbestos Program Manager for the Bourne Public Schools. The Asbestos Program Manager serves as the lead administrative person in the control program, and serves as the representative for the LEA to make certain that requirements under this section are properly implemented. (Section 763.84 g(1)).

The Asbestos Program Manager may also serve as the Asbestos Project Coordinator, or may delegate that responsibility to a member of the Maintenance Department or Buildings and Grounds Department. The Asbestos Program Coordinator handles the day-to-day responsibilities under 40 CFR 763. The Coordinator shall be responsible at a minimum, for the following tasks:

(1) Arrange and coordinate training of all custodial and maintenance staff, and arrange for annual updates for new personnel since the previous training program. Ensure that new custodial or maintenance personnel are trained within 60 days of starting employment.

(2) Arrange for abatement procedures identified in the abatement/response section.
(3) Comply with all applicable local, state, OSHA, and EPA regulations pertaining to removal, repair, or enclosure of asbestos.
(4) Coordinate routine maintenance activities by in-house maintenance personnel.
(5) Make a decision in conjunction with the Asbestos Program Manager, to retain outside contractors in the event of a major release episode, or major planned abatement activities. Coordinate all work by outside firms during these periods.
(6) Ensure that short-term workers (non-school employees) who may come in contact with asbestos are provided information regarding the locations of ACBM and suspect ACBM.
(7) Ensure that workers and building occupants are informed annually about inspections, response actions, and post-response actions. including periodic reinspection and surveillance activities.
(8) Establish and implement a respiratory protection program for all affected custodial and maintenance employees.
(9) Obtain and maintain all specialized equipment needed to implement this plan, including HEPA vacuums, disposable coveralls, respirators, etc.
(10) Monitor all remaining ACBM in the building, and maintain all required warnings, notifications, signs, labels, and records as required by the EPA and OSHA.

6.2 BUILDING OCCUPANT NOTIFICATION

One of the most important aspects provided under the O & M program, is the notification of affected persons, that ACBM is present in the school building. There are specific requirements on transfer of this information. Notification may take place through posting of signs and labels, through information sessions, and by providing written notification. (Section 40 CFR 763.84c)

(1) The EPA requires that administrators of primary and secondary schools notify employees and parent-teacher groups about the presence of friable ACBM, and to provide specific handling instructions to custodial and maintenance workers (Asbestos-Containing Materials in Schools; Identification and Notification Rule 40 CFR 763.100- 763.119)

(2) Both EPA and OSHA require the LEA to notify all building occupants, the parents of school children, and contractors working in the building of the presence of ACBM, any abatement plans, and the location of the management plan for the school.

(3) The OSHA Asbestos Construction Standard and Hazard Communication Standard require notification of all contractor employees and school custodial and maintenance personnel of the potential to come in contact with asbestos. (29 CFR 1923.58 and 29 CFR 1910.120). AHERA extends coverage of the EPA Worker Protection Rule (40 CFR 763) to maintenance and custodial personnel in schools which are not covered by the OSHA Construction Standard. New maintenance employees must be informed and/or trained within 60 days of beginning work. The Asbestos Program Manager should notify the contractor in writing, and receive written acknowledgement that all employees of the contractor have been informed.

If the contractor is involved with the asbestos abatement activities, the written notification from the contractor must include the training and licensing of the asbestos workers and supervisor.

(4) Warning labels must be placed on ACBM and suspected ACBM assumed to be ACM located in routine maintenance areas (such as boiler rooms) at each school building. The signs are placed in accessible locations to alert and remind building occupants not to disturb ACBM. The labels may be placed on entrance doors to utility and mechanical rooms. The labels must say:

CAUTION: ASBESTOS. HAZARDOUS. DO NOT DISTURB WITHOUT PROPER TRAINING AND PROTECTIVE EQUIPMENT. AUTHORIZED PERSONNEL ONLY. (40 CFR 763.95)

6.3 EMPLOYEE TRAINING AND EDUCATION

All custodial and maintenance staff, and contract employees who work in the school system must be trained to use special work practices and procedures in handling asbestos. Training for other school personnel who may occasionally pass through areas where asbestos is present, such as teachers, and office personnel, is voluntary but recommended. Interested parents or representatives of parent-teacher groups may also be invited at the discretion of the LEA.

(1) Training takes place on two levels. The first is a two-hour "general awareness" session which must be attended by all maintenance and custodial personnel regardless of whether they work with asbestos, and may include the other persons identified above. It is recommended that this session be given annually. The two-hour session includes the following topics:

(a) Information on the uses and forms of asbestos in the schools
(b) Health effects associated with asbestos exposure.
(c) The specific locations of ACBM in the work areas of each school.
(d) The presence of any damage or deterioration of ACBM.
(e) The name and telephone number of the Asbestos Program Manager, and the location of the Management Plan for the Bourne Public Schools. The administrative offices are located at 36 Sandwich Road, Bourne, MA. 02532. The telephone number is (617) 759-4514.

(2) The Bourne Public Schools should identify one custodial or maintenance employee for each school or for the school system whose activities may include assignments which affect the disturbance of ACBM, or who may be involved in emergency asbestos repairs. These employees must have an additional 14 hours of training. This training should be repeated at three-year intervals or when a new employee is involved. This session should include the following:

(a) The overall scope and direction of the asbestos program for the Bourne Public Schools
(b) The requirements of the Operations & Maintenance program.
(c) Methods and procedures for handling and disposing ACBM.
(d) Proper selection and use of respiratory protection and protective clothing.
(e) The availability and use of special cleaning equipment such as HEPA vacuums, steam cleaners etc.
(f) Hands-on training in the proper use of respirators, protective equipment, work practices, and control of asbestos fiber release.

(g) Recordkeeping requirements, and generation of Work Orders through the Asbestos Program Manager.
(h) Training and licensing requirements under Commonwealth 453 CMR 6.0. Records must be maintained for each employee's training, indicating the date, location, course content, trainer(s), and any certifications issued from the training.

The regulations only specify that the "responsible person" serving as Asbestos Program Manager (and/or Coordinator) be properly trained in the hazards of asbestos. Attendance at a 24 hour training program by the Asbestos Program Manager is strongly recommended.

6.4 WORK PRACTICES FOR CLEANING, MAINTENANCE AND RENOVATION

This section describes the special work practices and procedures which are used by the maintenance personnel. The training is important to minimize fiber release. Cleaning conducted carelessly may cause damage to ACBM, releasing more fibers.

Cleaning: Cleaning activities are described as initial cleaning, periodic cleaning, minor release episodes, and major release episodes.

Initial Cleaning: The initial cleaning is to remove all asbestos debris from floors, walls, and other surfaces in areas where asbestos may have settled. This includes HEPA vacuuming of carpets and floors and wet cleaning of walls and surfaces. This is performed once before the O&M program starts in schools where damaged or significantly damaged thermal insulation is present.

Periodic Cleaning: HEPA vacuuming of affected areas as described above should be performed semiannually in areas of buildings where damaged thermal insulation is present.

Minor release episodes occur when less than 3 square feet or 3 linear feet of ACBM falls or is damaged, or when small amounts of debris fall on the floor, walls, or pipes. These releases may be handled by the appointed maintenance staff. The following procedures should be used:

(1) Restrict access to the area during cleanup. Post signs and use stanchons or barriers to keep out others.
(2) The proper protective equipment should be used, including full length Tyvek coveralls and respiratory protection.
(3) Any asbestos debris on the floor, walls, or pipes should be thoroughly wetted, carefully shoveled up and placed in a 6 mil asbestos disposal bag.
(4) The area should then be HEPA-vacuumed or steam cleaned. All debris, cleaning supplies, vacuum bags, protective clothing etc. should be placed in the disposal bag.
(5) Any damaged areas must be cleaned and repaired with asbestos-free materials.
(6) Clean all surfaces, fixtures or other components in the immediate work area with HEPA vacuum, or wet cleaning.

Major release episodes occur when more than 3 square feet or linear feet of asbestos falls or is damaged, or when large amounts of debris fall on the floor, pipes, etc. The following procedures should be used

(1) Immediately restrict access or prevent entry, post warning signs, and block off access by means of stanchons or barriers.
(2) Notify the Asbestos Program Manager for the Bourne Public Schools.
(3) Shut off the air handling equipment in the area of the release, and cover or block air supply and air return vents to prevent spread of the asbestos.
(4) The Asbestos Program Manager will assess the situation, and design the complete response action including notification of an outside contractor, selection of proper personnel protective equipment, and if necessary, make arrangements for evacuation of the school or a portion of the school.

There may also be emergency major release episodes which occur before during, or after occupancy of the school building by students, such as a hallway ceiling falling during classroom change. Immediate evacuation of the school, notification of the Superintendent's office, as well as Massachusettes DLI and EPA Asbestos Program for Region I in Boston. The clean-up program would then be implemented, using an outside contractor. Actions to minimize student exposure would include showering or HEPA vacuuming of clothing, and covering the floor with plastic to prevent trampling. Heavily contaminated clothing would be disposed of as contaminated.

There are no locations in the Bourne Public Schools where an emergency release episode is likely to occur. Large areas of friable surfacing ACBM in occupied student areas have not been observed or have been removed through earlier abatement projects.

Maintenance: There are three levels of maintenance activities which might involve asbestos: accidental disturbance of ACBM; small scale repair or removal of ACBM; and large scale repair or removal of ACBM. All maintenance activities which might cause accidental disturbance of ACBM; small scale manipulation of ACBM; or large scale manipulation of ACBM should only be performed by the designated individuals having the 14 hour training course.

The small scale manipulation is considered a "small-scale, short-duration" project for purposes of AHERA. In the Commonwealth of Massachusetts, this is defined as 3 linear feet or 3 square feet of ACM. The intent of this type of project is to allow the trained custodial or maintenance person to perform the work while school remains in operation during a removal. Typical activities defined by AHERA to be "small-scale, short-duration" include removal of one glove bag of pipe lagging or fittings; replacement of ACM gaskets on a valve; installation or removal of a small section of asbestos-containing dry wall; using an abrasive pad on a floor polisher to clean a floor surface prior to waxing; drilling of holes through Transite panelling; replacement of lights near ACM; replacement of lay-in acoustical tile which either contains ACM or is underneath known or

suspect ACM; or installation of electrical conduits through or near ACBM. To meet the exemption, the project must be one of the acceptable removal techniques which include glovebag, mini-enclosure, entire structure removal, or enclosure. Before any small scale manipulation of ACBM is performed, the custodian or maintenance person will assure that the following steps are taken:

(1) All contaminated objects are wet-wiped or HEPA vacuumed, and the general area itself cleaned or HEPA vacuumed.
(2) All moveable objects should be removed from the work area, and non-moveable objects covered with 6 mil plastic.
(3) The floor, and if required, the walls covered with two layers of 6 mil plastic extending well beyond the repair area, and secured with duct tape or adhesive spray.
(4) During any removal or repair, the work area should be thoroughly and frequently wetted with amended water, except where water cannot be used for safety reasons, such as near live electrical equipment.

Glovebag use should be taught as part of the 14-hour course, including proper training in glovebag removal. Mini-enclosures are used on short lengths of pipe where glovebags cannot be used. The mini-enclosure is used for one worker, and is constructed of plastic sheeting around a frame, with a built-in changing area, built around the location of the work, such as a pipe or ceiling. Negative air may be maintained in the mini-enclosure by means of a HEPA vacuum. Protective equipment requirements, and proper work practices are taught in the 14 hour course.

The large-scale manipulation projects should not be performed by any custodial or maintenance employee who has had just the 14-hour course. It should be performed only by a licensed abatement contractor in the Commonwealth.

There are general work practices which apply to all schools in the school system.

(1) Several schools in the school system were identified as containing vinyl asbestos floor tile. In many cases the surface of the tile appears to be abraded. Often, custodial employees will use abrasives to clean floor surfaces prior to the application of floor wax. This practice should be strongly discouraged, as it wears away the top tile surface, exposing the underlying matrix which may contain asbestos. Where a dull white finish is observed through the top surface of the tile, indicates that damage to the tile has occurred.

(2) Hammering or drilling through floor tile to fasten carpeting or other materials should be prohibited.

(3) Chairs and desks should be equipped with rubber feet or gliders to reduce damage to the floor tile surfaces.

(4) Efforts should be made to minimize storage of maintenance supplies in the portions of boiler rooms nearby boilers, breeching, headers, or other areas which might be damaged. This applies specifically to items such as ladders, chairs, desks, and other large items which might damage the surface.

(5) The storage of desks, chairs and other school supplies in pipe tunnels or chases where there is ACM should be discouraged. In addition to limiting access, movement of these items may cause damage to the surface.

(6) Where ladders are required in areas where thermal system ACBM has been documented, hinged-type ladders should be used if possible. Custodial employees are discouraged from leaning extension ladders against boilers, breeching, or headers.

6.5 RESPIRATORY PROTECTION

A formal respiratory protection program is required for the school system as a part of the O & M program, since custodial and maintenance employees will be required to use air-purifying respirators under certain conditions for small-scale short-duration projects involving asbestos. The OSHA Construction Standard requires use of respirators whenever exposure exceeds, or may be reasonably expected to exceed the Permissible Expoure Limit (0.2 fibers per cubic centimeter of air as an eight-hour time-weighted average exposure).

The OSHA Respiratory Protection Standard defines a "minimally acceptable respiratory protection program" which includes requirements for a written program, selection of the proper respirator, restrictions and limitations, use, cleaning, maintenance and storage of the respirator. All employees who will be using respiratory protection shall be trained in its proper use, and shall have a chance to don the respirator, including qualitative fit-testing before any assignment in which the respirator is required. All employees using respiratory protection should complete a course with this minimum content. All employees who use air-purifying respirators should receive a medical clearance from their physician at least once per two years. EnviroScience Consultants, Inc. will work with the Asbestos Program Manager to assure these requirements are implemented.

6.6 ROUTINE PERIODIC SURVEILLANCE

The custodial and maintenance staff serves as the eyes and ears for the asbestos program. They are likely to be the first persons to observe asbestos debris or newly damaged ACBM. Once the initial inspection has been completed, periodic inspections must be made to assure that the condition of the ACM in the building has not subtantially changed.

Routine periodic surveillance shall be conducted at least twice per year by the Asbestos Program Manager as assisted by the custodial or maintenance person assigned to the task. Any individual performing the periodic reinspection must have completed an EPA-approved 16 hour training course or received equivalent training for O & M and periodic reinspection. The inspection includes a visual examination of all areas identified in the management plan. Any change in the condition of the insulation shall be noted on the Periodic Surveillance Report, signed, and returned to the Asbestos Program Manager for inclusion in the management plan. A copy of the Periodic Surveillance Report is shown.

The visual inspection may be supplemented by periodic air sampling in suspect areas to find whether there is an actual exposure. Air sampling provides data on exposures at that instant, and should be used in combination with the inspections to give a good assessment.

In addition to the scheduled semiannual inspections, custodial and maintenance personnel should frequently make visual checks in work areas, and immediately report any visible debris or newly damaged areas to the Asbestos Program Coordinator without waiting for the semi-annual survey.

6.7 RECORDKEEPING REQUIREMENTS

Another important part of the O & M program is the need to keep detailed and accurate records of program activities and procedures. The recordkeeping portion also sets up the procedure to notify the Asbestos Program Manager, and to initiate small-scale, short-duration abatement projects.

The recordkeeping system must track two types of data- information on the physical condition of ACBM remaining in the school, and any corrective measures taken on the ACBM, and the data associated with personnel involved in the asbestos program for the Bourne Public Schools.

General Building Work Authorization/Asbestos Work Order: The Asbestos Program Manager is responsible for overseeing the entire O & M program for the Bourne Public Schools. A General Building Work Authorization must be obtained from the Asbestos Program Manager before any non-routine maintenance activity which might involve asbestos is involved. This gives the Program Manager the chance to determine whether ACBM may be involved. The Program Manager will check the management plan and approve the work. If ACBM is involved, the Program Manager will issue an Asbestos Work Order. This work order will identify the work to be performed, and will have an order number, so that any work may be audited in the future by the EPA or DLI. Copies of the General Building Work Authorization and Asbestos Work Order are shown.

The Asbestos Work Order identifies where the work is to be performed, what work is to be done, and the types of controls used to prevent the spread of airborne asbestos fibers. Either the names of the school employees or contract employees performing the work are to be identified on the Work Order. All Asbestos Work Orders become part of the management plan for the school, and are reviewed during the three-year reinspection of each school.

Whenever an asbestos project is to be performed, the Asbestos Program Manager must complete an Asbestos Project Notice (40 CFR 763.124). A copy of the notice must be submitted to the EPA and DLI at least ten days before planned abatement occurs, and within 48 hours after emergency abatement occurs. A copy of the Asbestos Project Notice is shown.

If asbestos removal from the school takes place, the Asbestos Program Manager must complete an Asbestos-Containing Building Materials Disposal Document. This form includes the location of the landfill, the name of the transporter, the asbestos work order number, and establishes a "chain-of-custody" to follow the ACBM from the point in which it is removed from the school to the ultimate disposal location. The Asbestos-Containing Building Materials Disposal Document is shown.

It is the responsibility of the Asbestos Program Manager to assure that these forms are all completed for any abatement project undertaken during the life of the O & M program.

OSHA also requires that records of employee exposure and medical surveillance be maintained for the length of employment plus 30 years. Sampling results must be provided to the employee, and the employee must be notified of his(her) right to see the medical files. In addition, several of the AHERA requirements including the program plan, work practices, respiratory protection, fiber release episodes etc. require written documentation to some degree. The Asbestos Program Manager should become familiar with these requirements, and assure they have been met.

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SCHOOL OTIS MEMORIAL ELEMENTARY
LOCATION BOURNE

DATE 9/22/88

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ROOM/LOCATION	CEILING	WALLS (SURFACING)	FLOOR	THERMAL SYSTEM, MISCELLANEOUS
FREDERICK DUNBERRY, PRINCIPAL BUILT PROBABLY AROUND 1960 - 1962.				
398 STUDENTS + 22 FACULTY GRADES K-3		14		
DONCRAMER BEN TOBEY, HEAD CUSTODIAN - 28 YRS. IN BOURNE SCHOOLS -				
INT: JUST EXPOSED PIPES IN KITCHEN, AND BOILER ROOM				
APPROX 8 YEARS AGO, TAPED JOINTS AND ENCAPSULATED. MOST PEOPLE HERE ARE NEW AND HAVENT WORKED HEREVERY LONG. HAVE NOT HAD BOILERS				
RECOVERED. OIL/GAS.		FORCED STEAM/HOT WATER. COMBI		
SCHOOL IS CONVENTIONAL CONSTRUCTION BUILT ON SLAB EXCEPT FOR BOILER RM & TUNNEL. CINDER				
BLOCK CONSTRUCTION W/ BRICK FACE EXTERIOR. DIMENSIONS OF SCHOOL ARE:				

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DATE 9/22/88

SCHOOL OTIS MEMORIAL
LOCATION BOURNE

ROOM/LOCATION	CEILING	WALLS (SURFACING)	FLOOR	THERMAL SYSTEM/ MISCELLANEOUS
Cafeteria	Wood		9" Tan/Grey Striated Floor tile mod wear	Herman Nelson FMR Univents
			No Damage - Looks like older tan striated tile High wear. Mod. damage.	
		1% CHRY.	SDH 09-22-88-02	
Kitchen/ Food Stor	Plaster on lath directly below roof - no false ceiling	C.B.	Cement	① All CW/HW piping Uninsulated ② Two Nelson CMR's - FG insulated w/ six mud cement fittings N.D. ③ Compressor - All piping from floor uninsulated
Teachers Lounge	Cellulose perf. tiles under corrugated steel.		9" Tan speckled Tile - mod wear - No Damage.	FMR Univents - No insulated piping.
Supply	Corrugated Steel.		①	2 Lateral Risers FG cloth covered ND. 6 Fittings. To Sink in Fac Rm. ② FMR Univents - No insulated piping.

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SCHOOL OTIS
LOCATION BOURNE

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ROOM/LOCATION	CEILING	WALLS (SURFACING)	FLOOR	THERMAL SYSTEM/ MISCELLANEOUS
Janitor Room	Corrugated steel.		9" Tan striated floor tiles. Mod wear No Damage.	1 FMR Univents No exposed piping
Boiler Room:	See Dwg	D-3		
C/R 19	Perf. tiles Under Corr. Steel	Plaster on lath.		1 FMR Univents: All HW/CW piping uninsulated, from basement.
C/R 18 (27'x27')	Same	Same	9" Tan/Brn Speckled Floor Tile Suspect ACBM.	Closets - Plaster on lath. Same
			Mod. Wear - No Broken Tile.	
C/R 17	Same	Same	9" Tan/Brn Speckled Floor Tile. Suspect ACBM. Mod Wear Some breaks by Frt. of room. 5-6 brkn. tiles SDH 09-22-88-03	Same
				5% CHRYSOTILE
C/R 16	Same	Same	Same - No Damage.	Same

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SCHOOL OTIS
LOCATION BOURNE

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	ROOM/LOCATION	CEILING	WALLS (SURFACING)	FLOOR	THERMAL SYSTEM/ MISCELLANEOUS
*	C/R 15	Same	Same	9" Green striated floor tile. Mod wear Some damaged areas a/t c near sink	Same
			5% CHRY.	SDH 09-22-88-04	
				Some damaged (Water?) by door.	
	Note: All entryways betn. C/R's have one FMR w/ no insulated piping and similar striated floor tile.				
*	C/R 14	Same	Same	9" Tan/Gray Speckled Floor Tile Mod wear - 2 Large	Same
			5% CHRY.	Damaged areas 10 bkn tiles 30 lifting ones. SDH-09-22-88-05	
*	C/R 13	Same	Same	9" Pink Speckled Floor Tile. High Wear Several Damaged	Same
				Areas By Frt. of Room - 15 bkn tiles. 25 lifting ones	
			1% CHRYSOTILE	SDH 09-22-88-06	

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SCHOOL OTIS
LOCATION BOURNE

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ROOM/LOCATION	CEILING	WALLS (SURFACING)	FLOOR	THERMAL SYSTEM/ MISCELLANEOUS
C/R 12	Same	Same	9" Tan/Grn. Speckled Floor Tile - Sev. Wear Ctr of Room. No Breaks.	Same
			Entry betn. C/R 12/13 has 6 bkn/damaged tiles	
~~Women's~~ Boys Room	Same	Glazed Block/ Hard Plaster 3 Coat	Ceram. tile.	① False metal clng. rear by HVAC - No insulation - No access ② All plumbing behind rigid walls.
Girls Room	Same	Same	Same	Same
Custodian	Plaster on metal lath.		9" speckled tile. Mod Water damage *	① Access to shutoffs. bathroom - All FG. ② S.D. Mud ACBM Fittings Rear of Access ③ Piping to Sink not insulated.
Hallway	Corrugated Steel	CBI Glazed Block	9" speckled floor tile same as clrs.	2 WMR's - NO exposed piping.
Men.	Plaster on Lath.	3 Coat Plaster. Glazed Block	Ceramic Tile	1 WMR - NO exposed piping - All piping to sinks behind wall.
Women	Same	Same	Same *	1 Access Panel - All lines RG. ③ S.D. ACBM Fittings. Same.
Side Entry Door.	Cellulose Tile on Corrug. steel.	CBI glazed block.	9" speckled floor tile. SL. wear - 20 tiles lifting by radiator	1 WMR - NO exposed piping

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SCHOOL OTIS
LOCATION BOURNE PG. 6 OF 9

DATE 9/22/88

ROOM/LOCATION	CEILING	WALLS (SURFACING)	FLOOR	THERMAL SYSTEM/ MISCELLANEOUS
PRINCIPALS OFFICE	SAME		9" Blue Striated Floor Tile Low wear, No Damage	1 WMR-No exposed piping
Nurse	SAME	C.B.	9" Speckled Flr Tile-Low wear No Damage	1 Sink-Lines FG insulated w/ 5 mud fittings, covered ND
				1 WMR-No exposed piping.
Office Area				
Main Entry	~~Sprayed~~ Perf. cellular tiles under corrug. steel		9" speckled vinyl floor tiles. Low wear. Tiles lifting by frt door and along (R) Wall by FMR	1 FMR-No exposed piping
Clr 6	corrug. steel NO (SDH 09-22-88-08) Perf. tiles under corrugated steel.	C.B.	9" Blue striated vinyl floor tile. Mod. to Sev. Wear By Sink No Damage	Water lines. FG insulated on sink No fittings 1 FMR-Unvents-NO exposed piping.
* Clr 7	Same	Same	* 9" Blue/Green Striated Vinyl Floor Tile. 16 bkn tiles (SDH 09-22-88-07)	Same
Entry Clr 6-7			9" Green striated vinyl floor tile - Mod. wear 7 bkn tiles by door. and/ bathrooms.	NO

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SCHOOL OTIS
LOCATION BOURNE

DATE 9/22/88

PG. 7 OF 9

ROOM/LOCATION	CEILING	WALLS (SURFACING)	FLOOR	THERMAL SYSTEM/ MISCELLANEOUS
Clr 8	Same	Same	Carpet over striated vinyl floor tile - No wear/No Damage	Same
Clr 9	Same	Same	9" Tan/Brn. Speckled Vinyl Floor Tile - Low Wear -	Same
			Good Condition. No Damage	
Entry betn Clr 8/9			Tan Speckled Vinyl Floor Tile. Low Wear 4 Bkn Tiles.	1 WMR - No exposed piping
Clr 10	Same	Same	9" Grey Speckled Vinyl Floor Tile - Low Wear. No Damage.	Same as Clr's.
Clr 11 (30 x 39)	Same	Same.	9" Pink speckled Vinyl Floor Tile same	Same
Clr 5	Same	Same	9" Blue striated Vinyl Tile SL. wear. 2 Bkn tiles by exit door	Same. No insulated piping on sink
Hallway			9" speckled vinyl floor tile - some replacements - damage to 5	
			tiles (grn striated) by door.	

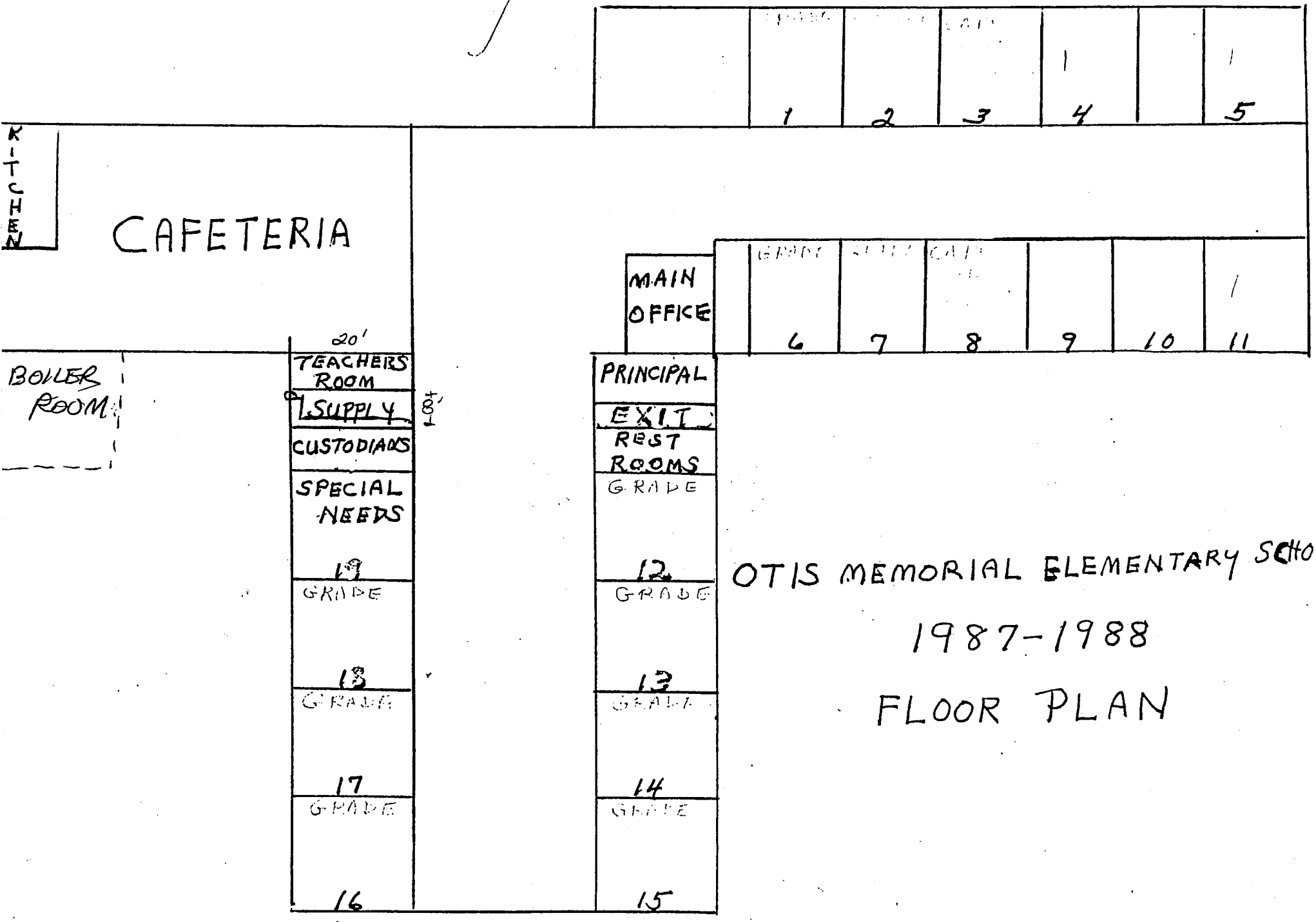
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SCHOOL OTIS
LOCATION BOURNE Pg. 8 OF 9

DATE 9/22/88

ROOM/LOCATION	CEILING	WALLS (SURFACING)	FLOOR	THERMAL SYSTEM/ MISCELLANEOUS
C/R 4	Same	Same	Carpet over Speckled vinyl floor tile - No wear No Damage	Same
C/R 3	Same	Same	9" gray/brown Speckled vinyl floor tile.	Same.
C/R 2	Same	Same	9" gray/blue striated floor tile - Moderate wear - 1 bkn tile.	Same
C/R 1	Same	Same	Carpet over brown speckled floor tile.	Same
Hallway betn. C/R 1,2	Same	Same	9" grn. striated vinyl floor tile. Mod wear 1 bkn tile	Same
Reading Room	Perforated tile under corrug. steel.	Same	9" brn speckled floor tile.	Same

FIGURE D-1 - SCHOOL LAYOUT

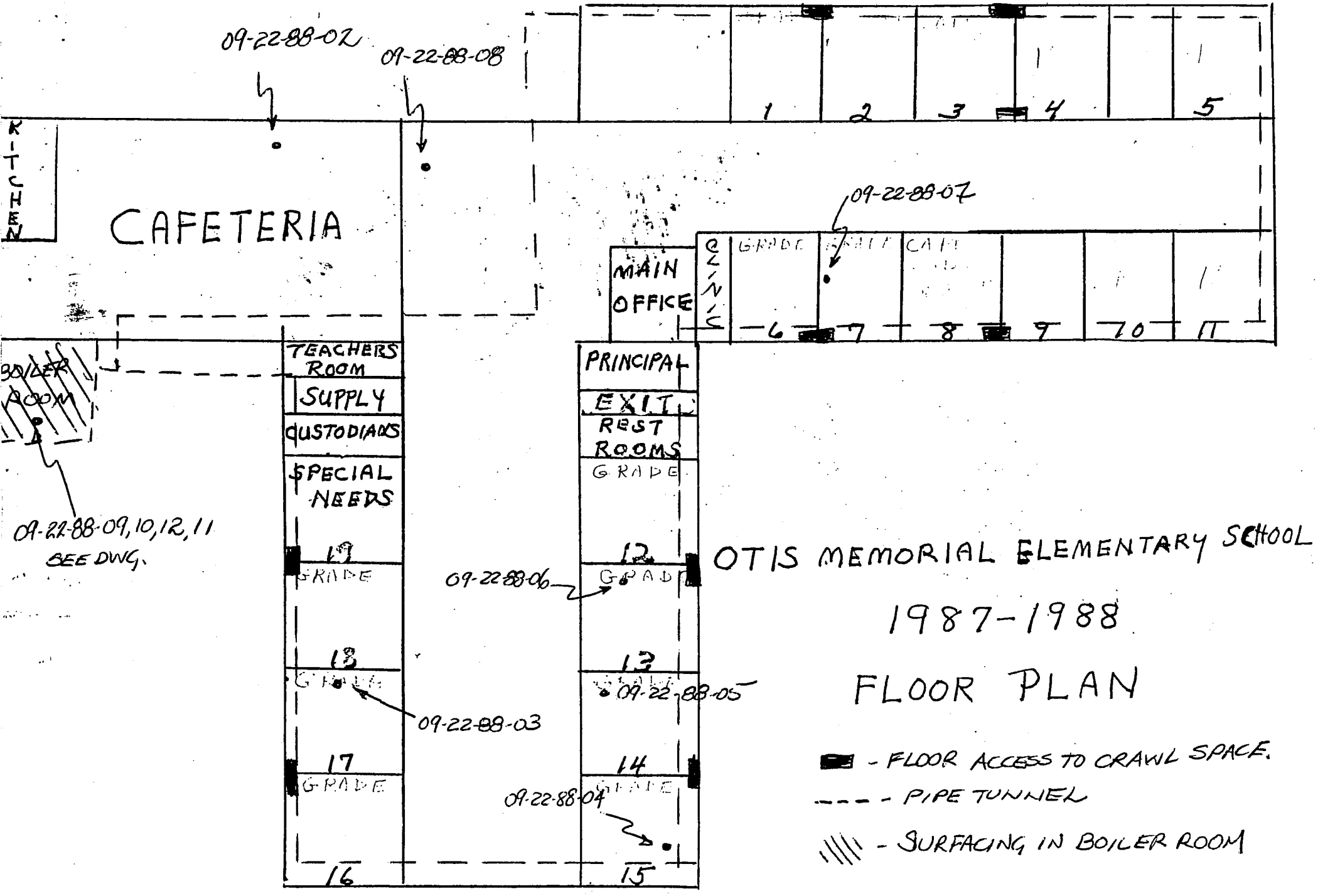


OTIS MEMORIAL ELEMENTARY SCHOOL

1987-1988

FLOOR PLAN

FIGURE D-2
PRINCIPAL ACBM LOCATIONS



OTIS MEMORIAL ELEMENTARY SCHOOL

1987-1988

FLOOR PLAN

■ - FLOOR ACCESS TO CRAWL SPACE.

- - - - PIPE TUNNEL

//// - SURFACING IN BOILER ROOM

SAMPLE LOG and SAMPLE NOTES

DOCUMENT NUMBER: SL-1

Building Number and Name: B06 Otis Memorial Elementary

Sample Area/Lot Number and Name:

Drawing/Sketch Number and Name:

THIS IS A CHAIN-OF-CUSTODY DOCUMENT. PLEASE FILL OUT COMPLETELY AND SIGN ACCORDINGLY

Sample Number	Receiver's Initials	Photo. Number	Description of Sampled Material	Sample Site Location
SDH 09-22-88 -02			Tan nonfibrous homogeneous Floor Tile	Cafeteria/All Purpose Rm. Older Tile by Rear of Room.
SDH 09-22-88 -03			Tan nonfibrous homogeneous Floor Tile	C/R 17. Broken tile by front of room.
SDH 09-22-88 -04			Green nonfibrous homogeneous Floor Tile	C/R 15 - Broken tile at aisle near sink
SDH 09-22-88 -05			Tan nonfibrous homogeneous Floor tile	C/R 14 - Broken tile
SDH 09-22-88 -06			Pink nonfibrous homogeneous Floor tile	C/R 13. Damaged area by front of room.
SDH 09-2288 -07			Blue/Green Nonfibrous homogeneous Floor Tile	C/R 7 - Broken tile near door.
SDH 09-22-88 -08			Tan nonfibrous homogeneous ceiling Tile	Main Entry

Receiving Analyst's Name: J. McGill

Receiving Analyst's Firm: EMSL

Receiving Analyst's Signature:

Date Samples Received:

Inspector's Name: Scott D. Herzog

Inspector's Firm: EnviroScience

Inspector's Signature: Scott D. Herzog

Date Samples Collected: 9/22/88

SAMPLE LOG and SAMPLE NOTES

DOCUMENT NUMBER: SL-1

Building Number and Name: B06 Otis Memorial Elementary

Sample Area/Lot Number and Name:

Drawing/Sketch Number and Name:

THIS IS A CHAIN-OF-CUSTODY DOCUMENT. PLEASE FILL OUT COMPLETELY AND SIGN ACCORDINGLY

Sample Number	Receiver's Initials	Photo. Number	Description of Sampled Material	Sample Site Location
SDH 09-22-88 -09			White fibrous homogeneous	Boiler #1 - Left side rear boiler covering.
SDH 09-22-88 -10			White fibrous homogeneous	Boiler #1 Front right corner. Boiler covering
SDH 09-22-88 -11			White fibrous homogeneous	Hot water tank, left V-brace.
SDH 09-22-88 -12				Boiler #2 - Right front side of boiler, near bottom. boiler covering

Receiving Analyst's Name: J. McGill

Receiving Analyst's Firm: EMSL

Receiving Analyst's Signature:

Date Samples Received:

Inspector's Name: Scott D. Herzog

Inspector's Firm: EnviroScience

Inspector's Signature: Scott D. Herzog

Date Samples Collected: 9/22/88

EMSL ELECTRON-MICROSCOPY SERVICE LABORATORIES INC.

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1800 PEACHTREE STREET
ATLANTA, GEORGIA
30309
404-355-4046

Wednesday, October, 5, 1988

EnviroScience Consultants, Inc.
66 Cedar Street
Newington, Ct. 06111

POLARIZED LIGHT MICROSCOPY (PLM) EPA METHOD 600/M4-82-020, December, 1982

PROJECT: #88-208 Bourne Public Schools

SAMPLE#	LOCATION	APPEARANCE	SAMPLE TREATMENT	ASBESTOS TYPE	%	NONASBESTOS FIBROUS	%	NONFIBROUS	%
SDH-09-23-88-08		Grey Fibrous Homogeneous	Teased Apart	Chrysotile	50	Cellulose	40	Gypsum	10
SDH-09-23-88-09		Brown Nonfibrous Heterogeneous	Crushed	None Detected		Cellulose	< 1	Quartz Gypsum Other	30 30 40
SDH-09-23-88-01		Brown Nonfibrous Heterogeneous	Crushed	Chrysotile	5	Cellulose	5	Quartz Gypsum	30 60
SDH-09-22-88-02		Brown Nonfibrous Heterogeneous	Crushed	Chrysotile	1	Cellulose	4	Quartz Gypsum	30 65
SDH-09-22-88-03		Brown Nonfibrous Heterogeneous	Crushed	Chrysotile	5	Cellulose	5	Quartz Gypsum er	10 20 60
SDH-09-22-88-04		Brown Nonfibrous Heterogeneous	Crushed	Chrysotile	5			Quartz Gypsum Other	40 30 25

Comments:

Dirk Shelmire
Analyst

Peter Frasca, PH.D.
President

DISCLAIMER: PLM has been known to miss asbestos in a small percentage of samples which contain asbestos. Thus negative PLM results cannot be guaranteed . Tiles and wipes should be testedwith either SEM or TEM .

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SDH-09-22-88-05		Grey Nonfibrous Homogeneous	Crushed	Chrysotile	5			Quartz Gypsum Other	45 10 40
SDH-09-22-88-06		Grey Nonfibrous Homogeneous	Crushed	Chrysotile	1	Cellulose	4	Quartz Other	45 50
SDH-09-22-88-07		Grey Nonfibrous Homogeneous	Crushed	None Detected		Cellulose	< 1	Quartz Other	20 80
SDH-09-22-88-08		Grey Fibrous Heterogeneous	Crushed	None Detected		Cellulose Mineral Wool	50 50		
SDH-09-22-88-09		Brown Fibrous Homogeneous	Crushed	Amosite	40			Gypsum	60
SDH-09-22-88-10		White Fibrous Homogeneous	Teased Apart	Amosite	20			Gypsum	80

Comments:

Dirk Shelmire
Analyst

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SAMPLE#	LOCATION	APPEARANCE	SAMPLE TREATMENT	ASBESTOS TYPE	%	NONASBESTOS FIBROUS	%	NONFIBROUS	%
SDH-09-22-88-11		White Fibrous Homogeneous	Teased Apart	Chrysotile	80			Gypsum	20
SDH-09-22-88-12		Grey Fibrous Homogeneous	Teased Apart	Chrysotile	80			Other	20

Comments:

Dirk Shelmire
Analyst

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